# *Chemical recycling of poly ethylene terephthalate (PET)*

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قال تعالى:

"وقلِ اعملوا فسيرى اللهُ عملكم و رسوله والمؤمنون وستردون إلى عالم الغيب والشهادة فينبئكم بما كنتم تعملون"

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# *Dedication*

***W****e dedicate this work with love to our families Mr.  & Mrs. Hashim Al-Abid and Mr. & Mrs. Emad Hajo, to our supervisor Dr. Adil ElHag also for our sisters and brothers, to my teacher Uz. Jamal Abd-alGader and to all of our friends.*

# Abstract

Chemical recycling of Polyethylene terephthalate, (PET), wastage has been investigated in this study. The aim of this work is recovery of Terephthalic acid and ethylene glycol from PET wastes. This process has been done in two stages. At the first stage, reaction between PET waste and sodium hydroxide for production of ethylene glycol and sodium terephthalate solution. At the second stage, reaction between produced sodium terephthalate and an acid ($H_2SO_4$ or HCl) led to Terephthalic acid production. Some important parameters such as PET: EG, PET: NaOH molar ratios, source of an acid and PET and solvent of PET have been studied. The optimum ratio between PET: EG (1:2.5) per 11.00 grams of PET, respectively. Ethylene glycol was found that is the best solvent, PET: NaOH molar ratio was (2.5:1), PET: EG molar ratio (1:2.5), sulphuric acid is better than Hydrochloric acid as an acid and PET bottles was a good source of PET.

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